DEVELOPMENT OF GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS FOR LOCAL GOVERNMENT ORGANIZATIONS: THE CASE OF RHODES MUNICIPALITY, GREECE

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ABSTRACT

In the present paper the design of a Geographic Information System for the Rhodes Municipality in Greece is presented and analyzed. For this purpose, findings from the 'Needs Assessment/ Requirements Analysis' study are summoned, whereas a series of broader parameters regarding the relevant development and implementation procedures are also brought up. The nodal importance of integrated approaches in the design of GISs, in a way that the users of the systems themselves but broader social necessities as well become the focal point, is underlined. The study forms a theoretically informed empirical research, useful for broader conceptualizations and conclusions.

Key words**: GIS design and development, Local Government Organizations, Needs Assessment/ Requirements Analysis, GIS Social Applications**

1. INTRODUCTION

In the present paper the design of a Geographic Information System for the Rhodes Municipality in Greece is presented and analyzed. For this purpose, findings from the 'Needs Assessment/ Requirements Analysis' study are summoned, whereas a series of broader parameters regarding the relevant development and implementation procedures are also brought up. In what follows we attempt to underline: a) the absence, as well as the necessity, of GISs applications in Greek Local Government Organizations, b) the importance of integrated approaches, as far as it concerns GIS design and

implementation, turning the needs of different kinds of users and broader social goals in a focal point, c) existing distortions and general weaknesses accompanying established systems in Local Administration Authorities; Finally, d) we present some important political aspects concerning the diffusion of automated geographic practices, given the factual interest and the funding of relevant actions on a European Union and national level. These goals will be achieved by combining bibliographical review, international 'good-examples' of GIS establishment as well as case study findings for the municipality under examination. In this frame, the study forms a theoretically informed empirical research, useful for broader conceptualizations and conclusions.

The proposed project concerns the development and implementation of an enterprise Geographic Information System in the Municipality of Rhodes. Through this system, the city of Rhodes, biggest urban centre of the South Aegean Region (i.e. one of country's thirteen regions) and capital city of the Dodecanese Prefecture in Greece, will acquire the necessary infrastructure so as to establish a series of specialized applications of geographic information management and handling. At the same time, the whole project will evaluate, incorporate and update already existing applications in several municipal services. These applications, some years after their inauguration, present functionality and staffing problems, while at the same time, no update or monitoring mechanisms had been foreseen, having as a result their depreciation.

Why a GIS for the Rhodes Municipality? Local Government, being this very institution placed at a close relationship with the citizens, is asked to come up to an increasingly broadening context of operations and services, often, as in Greece, having deficient infrastructure and limited funds. GIS use, although might seem as a 'luxury' for Greek administrational reality, can contribute in a creative manner to the realization of the institutional role of Local Government Organizations, to the achievement of their declared objectives and to time and/ or expenses saving (Masser et al, 1996). Indeed, today's stage in the applied GIS technology, allows for a total arrangement and regulation of a number of activities that are fundamental elements of a city's rational organization. Garbage and waste disposal, parking sites or traffic management, local transportation routes optimization are only some of the current applications of GISs, having important positive results on the urban and peri-urban environment (De Mers, 2000; Koutsopoulos 2001). Under this perspective, an enterprise GIS will be a useful, enhancing tool for supporting everyday activities of the

Rhodes Municipality Services. The latter are quite a few (*see Table 3*) and organised along traditional Greek administrative patterns as far as it concerns public services and institutions (e.g. personnel management of a paternalistic type, state interventionism, irrational and unproductive structure and staffing, lack of strategic purposes and advanced planning mechanisms, tolerance against informal activities and illegal buildings) (Leontidou, 1990).

However beyond 'popular' applications, such as the aforementioned, related to a city's operations improvement, there is an entire constellation of other uses, often downplayed or ignored. Such are, for example, those studying the spatial dimensions and development of vital social indicators (unemployment rates, employment and labour market participation, poverty, basic education abandonment etc) and putting goals in action (Okabe, 2005). On the other hand others refer to the citizens themselves or to different population groups (e.g. women, the unemployed, dwellers of an area) seeking to promote democratic participation. In other words, these applications seek to strengthen information and collective decisions in matters of spatial and town planning (*Public Participation GIS*) (Trevor, 2002; Elwood, 2002), given the negative background from the unilateral access of power institutions and technocrats to GIS (Pickles, 1995). These 'social' dimensions and applications of GISs are, according to our perception, a fundamental presupposition for dialectical interplay and acceptance on behalf of society. This notion is leading us to the following question:

Why a Social GIS for the Rhodes Municipality? Because this latter, might be one of the middle sized cities of Greece, diverging a lot, with respect to its total population, area and infrastructures, from the two Greek metropolitan urban centres (i.e. Athens and Thessaloniki), but at the same time is ranked among the first 10 cities with upcoming and dynamic features. Constant population increase, insularity, historical monumental wealth, tourism activities domination are some of the interesting but contradictory aspects of the city's modern physiognomy. Relatively high average levels of economic growth and life quality, in all possible aspects that this quality is possibly analyzed (residence, urban planning, free spaces, pollution, infrastructures, transport, unemployment etc), are far from depriving Rhodes of contrasts and malfunctions characterizing other Greek or European cities.

These contrasts intensification is obvious during the last decades with evident negative consequences. For example, the island's urban network is increasingly characterized by an improvident use of private cars and a traffic congestion, an irrational 'diffused' allocation of

public services, conflicting and annoying land uses mixture, downgrading of residential units and city areas etc (NCSR, 2004). These problems combined with a broader developmental dilemma put de facto by the almost unilateral dependence of the local production system on international tourism industry will certainly seek for answers and political interventions in the forthcoming years.

In what follows and after a short reference to the international and Greek experience (*subunit 2.1*), useful to document the methodological frame we adopt, the existent GISs in the Municipality of Rhodes, the fundamental parts of the design an implementation project as well as the proposed applications are presented (*subunit 2.2*). The last unit (*unit 3*) summarizes what has been said and points out some crucial, in our opinion, points.

2. INTEGRATED APPROACHES OF GIS PLANNING AND DEVELOPMENT

2.1 BASIC STAGES OF GIS DESIGN AND IMPLEMENTATION IN LOCAL GOVERNMENT ORGANIZATIONS: INTERNATIONAL AND GREEK EXPERIENCE

A corporate GIS aims to satisfy the needs of multiple users among the units/services of an institution or a Local Government Organization. Many municipalities in Greece have established such systems (15% of the total state, regional or local level, state authorities, for the year 2004 and according to Karnavou and Gritzas, 2006), which usually have been created to support the needs of certain Organization's services/ units and can be of a small utility to other units, as the example of Rhodes will demonstrate to us. Under this notion, a fragmented logic of spatial and descriptive information management prevails, leading to a different and often incomplete standardization and a meaningless multiplication of data among services; In parallel there exists an ongoing repetition of similar applications with no intra-organization cooperation.

Enterprise GISs are structured around an integrated data basis supporting the operations of all units/services/organizations of the institution. The 'GeoDatabase' implemented, either is concentrated at a central server while real-time access for all users can be provided, or is reproduced into many computers. This logic of central

management accompanied by radial development and 'networking' interaction offers a series of advantages, of which the most characteristic are (Harmon & Anderson, 2003):

- *The data are standardized/concentrated and redundancies in their reproduction are reduced.*

  For example, the institution, establishes an integrated standard of geocoding and address assignment.

- *The integrity of the database and the data is maximized.*

  Safety valves and procedures are implemented, so as to minimize data loss, wrong registrations, deletions etc.

- *Different services/ departments are joined through the common database.*

  In a complex institution, often irrationally planned, just like many Local Government Organizations in Greece, there are many different departments with particular and often overlapping goals and missions. International experience has proven that the creation of an enterprise GIS creates a new binding bond between individual services, which start seeing their own needs from a broader angle. Consequently, 'scale and agglomeration' economies are created, beyond the individual gains in costs, provided by the system's consolidation.

- *The ability to set goals and evaluate the effectiveness of services is increased.*

- *Gains and costs for geographic information management are centralized along with important benefit dispersion.*

Planning and implementing a GIS is complex matter and can last from one up to some, usually 3 or 4, years according to the size of the organization and the kind, the quantity or the desirable accuracy of the data that it is going to incorporate. An important role is played by the broader socio-institutional framework, the availability of geographic information and of relevant national infrastructures, the rate of new technologies incorporation, staff's level of experience and specialization, as well as

other factors. Relevant bibliography underlines a series of necessary steps that have to be followed during the development of a GIS, where the main ones are (Harmon & Anderson, 2003; Tomlinson, 2003):

- Needs assessment/ requirements analysis
- Initial planning and design
- Design and implementation
- Evaluation/ monitoring mechanism

The first two stages (i.e. *Needs assessment/ requirements analysis* and *Initial system planning and design*) have been completed in the case of the Rhodes Municipality (*see Pro_1 and Pro_2 Stage, Table 1)*. We can analyze them, without important omissions, into a series of individual sub-stages,:

Table 1: Needs assessment/ requirements analysis, initial planning and design

Stage	Description	Sub Stages	Description
Pro_1	Needs assessment/ requirements analysis	Pro_1.1	Needs and current users assessment
		Pro_1.2	Needs analysis; organizational/ administrative structure analysis; data forms and data networks/ flow analysis
		Pro_1.3	Requirement analysis
Pro_2	Initial system planning and design	Pro_2.1	Initial GIS products and potential uses design
		Pro_2.2	Future GIS products and potential uses design
		Pro_2.3	Planning of an even GIS organizational/ administrative incorporation and integration
		Pro_2.4	Database design, logical data models
Pro_3	Initial steps to implementation	Pro_3.1	Existing data or equipment evaluation and integration
		Pro_3.2	Market research for the supply of new data
		Pro_3.3	Market research for the supply of hardware and software
		Pro_3.4	Planning for future system upgrading and database update

In the forthcoming period, referring to the case of Rhodes city, according to evaluation results for the project's financing proposals, the **Design and implementation study** will be carried out. At the same time, the fundamental procedures that will be followed during the final step of **Evaluation/ monitoring mechanism** have already

been planned and will be specialized while consolidating the system (*see Table 2*). The establishment of a monitoring mechanism for the GIS operation, is a sine qua non term so as to ensure its functionality and viability. This mechanism can be internal or external and has to control the system's social utility, in the frame of the initial goals that have been set.

Table 2: Design and implementation, evaluation/ monitoring mechanism

Design and implementation			
Stage	**Description**	**Sub stages**	**Description**
Imp_1	Staffing	Imp_1.1	Staffing during design & implementation, establishing a 'Municipal GIS Service'
		Imp_1.2	Personnel education
Imp_2	Data integration	Imp_2.1	'Geodatabases' development and conversion plan
		Imp_2.2	Existing data incorporation
		Imp_2.3	New data integration
Imp_3	Information Products, diffusion policies	Imp_3.1	Data processing
		Imp_3.2	Data and information products production and distribution
		Imp_3.3	Special applications development

Evaluation/ monitoring mechanism	
Stage	**Description**
Mon_1	Accuracy, quality, product and data functionality control
Mon_2	System update
Mon_3	Personnel education
Mon_4	Evaluation of the system, based on the municipal strategic objectives
Mon_5	Local, regional or national- level system integration and expansion

Particular importance is given to the remark that a GIS is a socially constructed system needing constant feedback and active monitoring from, basic or peripheral, users. Under this notion, thorough design and planning are critical prerequisites for the successful outcome of the whole attempt. There are several cases, especially in Greece, where an indefinite and 'poor' planning led the whole project to collapse or just offered to the institution hardware for CAD designs and mapping. It is characteristically mentioned that in a research among Greek Public National Institutions (1998) it has been detected that only 14% of them had conducted a needs assessment, before assigning some GIS applications development to a relevant vendor or a group of specialists (Karnavou 2002).

2.2 RHODES MUNICIPALITY CASE STUDY

2.2.a Needs assessment/ requirements analysis

The study was carried between April 2005 and September 2005; It was based on an appropriately planned questionnaire, sent to all services of the Rhodes Municipality. At the same time, a series of open interviews with a number of officials, having as a goal to diagnose the existing and future needs of their services, took place. The basic goal set from the beginning was as follows: the incorporation of GIS to the institution becomes, in the best possible degree, a collective case and not the outcome of a process concerning only a small group of technocrats. The discussions with many officials about the intention of the Municipal Authority to install such a system, has proved to be a useful spark for an exchange of views, brainstorming but also various reproaches. The completion of the aforementioned questionnaire, successfully accomplished, was followed by a series of other steps (*see Table 3*). These are:

- the analysis of the organizational structure of Rhodes Municipality (organogram, directorates/ organizations, municipal enterprises and corporations, welfare services),
- the definition of operations but also of the relation among different units of the Municipality and other institutions of Public Administration in a local, regional or state level,
- the diagnosis of the networking between the services, the study of the forms and of the flux of information among the interdependences of units/ services, and finally
- the research about employees' specialization or familiarization with information technologies.

In the following table (*Table 3*) all Municipal Services (Directorates, Organizations, Enterprises) are listed, according to their: a) use of GIS, b) possession and management of spatial or descriptive information on a systematic basis, (digital or in printed form).

Table 3: Rhodes Municipality Services using GIS applications or managing data, 2005

code	Services (Directorates/ Organizations/ Enterprises)	GIS	Data type	
			Spatial data	Descriptive data
1.1	Directorate of Technical Agencies	-	+ / A	+ / D & A
1.2	Directorate of Medieval Town and Archeological Sites	+	+ / D & A	+ / D
1.3	Citizens' Services Directorate	-	-	+ / D
1.4	Municipal Water Supplies and liquid waste corp. (DEYAR)	-	+ / D & A	+ / D & A
2.1	Directorate for Planning and Support	-	-	+ / D & A
2.2	Directorate of Administrative Agencies	-	-	+ / D & A
2.3	Economic Agency Directorate	-	+ / D	+ / D & A
2.4	Municipal Police	-	-	+ / A
3.1	Intermunicipal Constructions and Tourism Corporate S.A.	-	-	-
4.1	Municipal Transport corp. (RODA)	-	-	+ / A
5.1	Directorate of Urban Planning	+	+ / D & A	+ / D & A
5.2	Municipal Environment Organization	-	-	-
5.3	Municipal Waste Management corp. (DEKR)	-	+ / D & A	+ / D & A
6.1	Cultural Organization	-	-	-
6.2	Municipal Gallery and Library	-	-	-
7.1	Occupational training centre "G.Gennimatas"	-	-	+ / D
8.1	Hephaestus Civil Society for medical services	-	-	-
8.2	Municipal Welfare Organization	-	-	+ / A
8.3	Day centre for elderly people (KAPH)	-	-	+ / A
8.4	Occupational training centre for disabled persons		-	+ / D
9	Prefecture of Dodecanese Local Municipalities and Communities Committee	+	+ / D & A	+ / D

(+):Using / (-):Not using / (A): Printed form / (D): Digital form

Existing GISs are located in two important services of the Rhodes Municipality: the Medieval City and Urban Planning Directorates respectively. The former is the par excellence competent service for the protection and conservation of the 'Old City', as a cultural monument of international value and at the same time, as a populated residential area. The latter is a typical urban planning service of a dynamically expanding Municipality. Both existing geographic information systems a) had been implemented through an insufficient design process and not updated ever since, b) concerned exclusively single-unit, project-oriented applications, c) are in need of immediate updating as they are not functional any more; Finally d) the problems registered on the level of staffing are equally intense since none is monitored by an experienced or full-time user. In this framework, the 'Initial design' Study formulated the basic axes of these applications incorporation to the new enterprise-scale GIS. Interesting, new applications were located at the Local Municipalities and Communities Committee, for which the possibility of integration through the GeoDatabase of the developing GIS is under research.

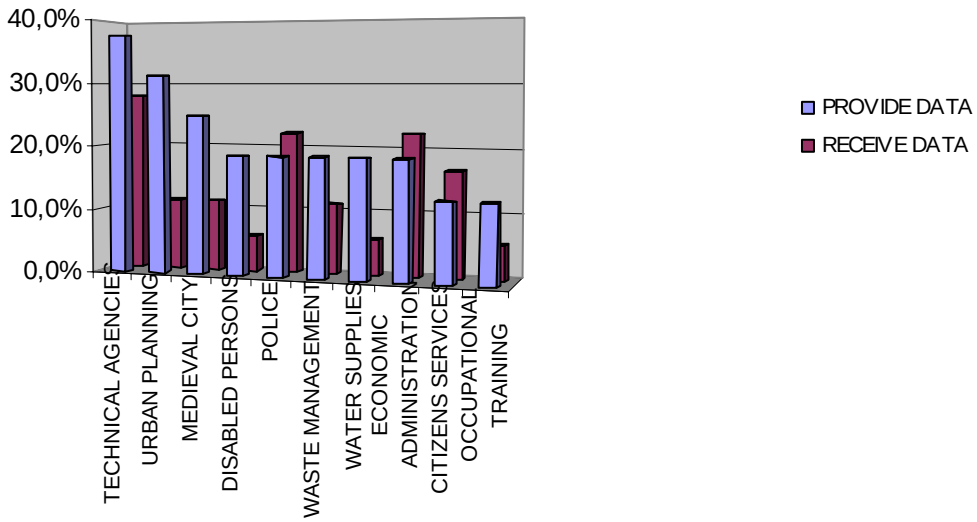
2.2.b Case study findings based on the contribution of the Municipality Services Officials

Some descriptive statistics, as those arose from the 'Needs assessment/ requirement analysis' Study for the city of Rhodes, are indicative and informative as well, about the shortages and needs of Greek Local Government Organizations. According to what has been already mentioned, 14% of the municipal services (directorates/ organizations/ enterprises) has a GIS; but in reality only one system (4,5% of services) remains functional. The latter system belongs to the Local Municipalities and Communities Committee and typically doesn't come under the Municipality of Rhodes organization chart; while no practical valorization of it was located from the rest services.

At the same time, the great majority of municipal services carries out internal exchanges of spatial data and implements relevant 'networkings' at an institutional level: 81,8% of services receives, while 63,6% provides data to other services, on a more or less systematic basis. As expected, a dominant role to this, formal or not, exchange of data and information is associated, according to hierarchical decreasing order, to Technical Agencies, Urban Planning Department and Medieval City

Directorates. The Municipal Police, the Water Supplies and the Wage Management corporations, the Disabled Persons and other institutions follow with corresponding appearance ratios (*see Figure 1*).

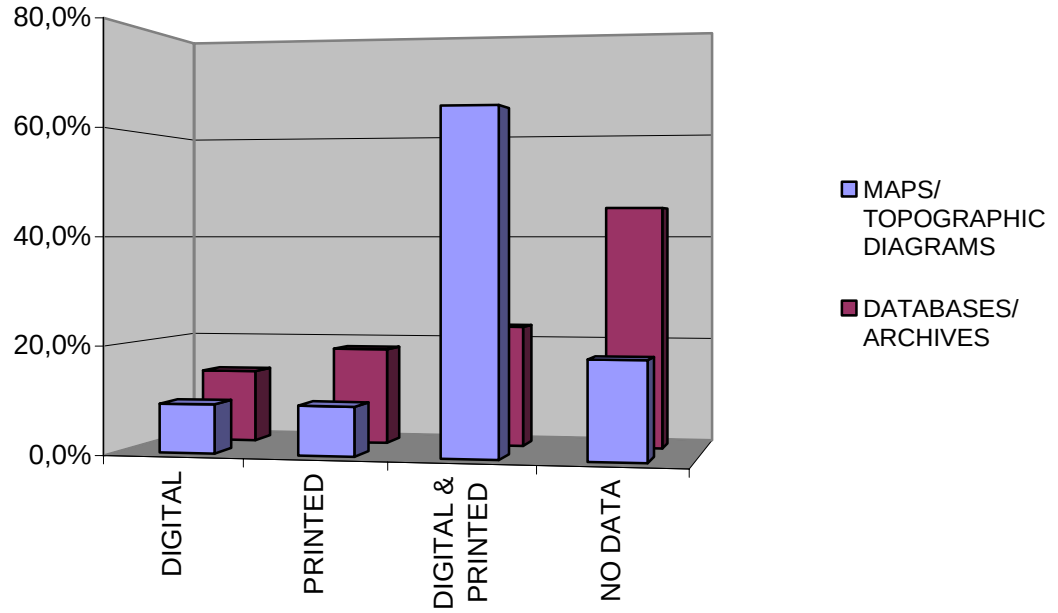
FIGURE 1. PARTICIPATION OF RHODES' MUNICIPAL SERVICES IN DATA EXCHANGE



On the level of spatial and descriptive information processing and management, the study showed the welter of databases and archives characterizing Greek administrative structures. Insufficient set-up and updating of the relevant data, is closely connected to the absence of national infrastructures for geographic information and metadata norms. Different kinds of digital or classic cartographic databases were located in almost half of the services under study, although approximately one out of four has exclusively printed matter (e.g. some kind of printed map or air photographs). This matter was registered analytically, after being analyzed on a level of individual cartographic layer (point, line, polygon). The lack of a complete base map showing all real estates (buildings and building plots or parcels) in the area of Rhodes Municipality was underlined. At the same time, the procedures of valorization after an appropriate valuation, filling in and projecting to the Hellenic Geodetic System of Reference (EGSA 87), of the existing cartographic layers, were planned.

Afterwards, the databases and other archives of digital or printed form, interesting the GIS under development, were studied. It was pointed out that only 13.6% of services don't have such archives, a fact that documents the benefits of developing a system of enterprise scale (*see Figure 2*).

FIGURE 2. MAPS AND DATA IN DIGITAL OR PRINTED FORM AMONG RHODES' MUNICIPAL SERVICES



Finally, the institution's officials were asked about the broader applications interesting their department. The relative classification is elucidating as to the lacks, needs and goals set by services. These answers were used as a general guide for the planning of the proposed applications and information products, which are presented in the next subunit.

2.2.c Proposed GIS applications and information products

The basic objective is that Rhodes GIS will serve three (3) broader categories of functions and more specifically that it will be:

1. a useful cartographic tool for mapping activities,

2. a spatial analysis and decision making mechanism, for the municipal services functionality improvement, and finally
3. a tool able for monitoring and analyzing a series of socio-economic indicators, along with their geographical patterns and dimensions.

These functions consist a difficult goal to be accomplished, and as every ambitious plan it will require time, money, appropriate staffing and especially, commitment. To specify the **Proposed Applications,** the aforementioned 'Needs assessment' Study conclusions, as well as relevant initiatives and open interviews material were taken into account. Afterwards, the **Information Products** associated with each application were defined, through an analytical interactive planning. According to it, through specialized seminars with those in charge of the municipal services, the form, the title, the contents in terms of spatial and descriptive data, the cost and other characteristics of each information product were defined.

More analytically, the **Proposed Applications** and the corresponding individual **Information Products** are listed in the following table:

Table 4. Rhodes Municipality GIS: proposed Applications and Information Products

s/n	Application Name	Description	Priority	Information Products (Indicative IPs)	Existing applications
1	**'Cartographic Support, Geocoding and City Guide' Application**	Cartographic Support of the Municipality services and of other institutions or individuals, having the real estate (place of residence, building plot, parcel etc) as a minimum unit of spatial reference; assignment of 'geocodes', settlement of street numbering problems; basic information on the geography of 'city's life' (shopping, recreation, hospitals, parking areas, bus stations etc).	Immediate	• Geocoding maps/ lists • Recreation/cultural site location analysis • City property map/ list	No
2	**'Municipal Networks and Infrastructures Management' Application**	Functionality improvement in the Municipal Enterprise of Water Supplies (DEYAR); monitoring of the network condition and quality, maintenance analysis and scheduling; monitoring and mapping of the municipal electric lighting and waste disposal networks.	Immediate	• Monitoring and maintenance of the DEYAR sewer/pipe network • Positions and types of litter bins used by DEKR • DEKR collection routes optimization map/ lists	No
3	**'Damages or Incidents Localization, Management, Reparation and Citizens' Services' Application**	An 'on the field' system for recording both municipal inspectors or policemen observations, as well as citizens' complaints on faults and other incidents. Monitoring of the relevant reparation/ maintenance procedures by simultaneous coordination of municipal	Immediate	• Complaints and damages analysis • Map/ lists of municipal official licenses for public space occupation by tourist/ recreation activities or businesses	No

Table 4. Rhodes Municipality GIS: proposed Applications and Information Products

s/n	Application Name	Description	Priority	Information Products (Indicative IPs)	Existing applications
		services; informative messages to the citizens about complaint handling procedures.			
4	**'Urban and Spatial Planning Support' Application**	Information about town planning and building/ housing regulations, land use; area zoning, problems diagnosis in residential units, socioeconomic data structures; municipal property mapping (buildings, building plots etc).	Immediate	Maps/ lists of: • Legal surveys index query • Building regulations and town planning • Land use analysis • Urban planning units and demographics analysis • Housing protection analysis	No
5	**'Rhodes Medieval City Maintenance, Protection and Restoration' Application**	Cartographic and maintenance support, restorations monitoring; existing GIS applications will be integrated after appropriate evaluation and updating.	Secondary	• Public works program map/ list • Medieval city tourist maps	Yes
6	**'Tourism and Productive Activities Support' Application**	Productive activities and business support; spatial location patterns and proposed areas, annoying activities' localization, economic socio-spatial data drawing.	Secondary	• Commercial, retail, service or industrial activities maps/ lists • Employment analysis map/ lists	Yes
7	**'Socioeconomic Analysis and Intervention' Application**	Socioeconomic analysis support emphasizing on population and employment geography, vulnerable	Secondary	• City zoning maps based on crucial social indicators (unemployment, poverty, education, social exclusion, drugs etc)	No

Table 4. Rhodes Municipality GIS: proposed Applications and Information Products

s/n	Application Name	Description	Priority	Information Products (Indicative IPs)	Existing applications
		social groups localization, local or nation-wide censuses geo-data structures.			

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3. SUMMARIZE

After all ‘is a GIS implementation a useful step towards an effective support of Local Government Organization’s everyday functions and objectives?’ In our conclusion we wish to underline the fact that a self-evident positive answer to the above question is often disorientating. In fact the questioning should concern the ‘why, how and which GIS applications are going to be developed, under what social and economic expediency, at what cost, with what staffing and in the framework of which Local Government Organization, institution or other socio-spatial entity?’ Successful stories of GISs development among USA, EU or even Greece, should not lead to great optimism since it is evident that important expectations and funds are invested in ‘insufficient’ applications; applications which soon prove to be inappropriate or non-functional due to a series of reasons (e.g. lack of systematic data update, insufficient administrative commitment, poor technical or broader support) . At the same time, good and bad lessons from GISs implementation as well as recent techno-economic restructurings, such as the expansion of an informational production pattern among industrialized economies, brings geographical information in the forefront of interest. Relevant contrasts appeared clearly through Rhodes Municipality case study, where the depreciation and the marginal role of the few existing GIS applications is combined with an overall agreement to ‘continue the effort’, at least on behalf of the questioned officials and personnel; Put it in other words, an early disposition to participate in the development of a GIS for the Municipality Services as a whole, is more than obvious.

In this framework, we consider as necessary to underline the importance of integrated approaches in developing and planning GISs. As shown from the Rhodes case, such a difficult but creative planning procedure has all pledges so as to: a) adjust through reasoning the extensive international bibliography and experience to the local realities of the organization under study, b) diagnose real needs and propose those applications that serve the institution’s objectives, c) succeed in gaining the consent or the active participation of the officials or personnel, as well as the citizens themselves, forming the basic users of a system.

Another crucial battle that has to be given both on behalf of scientists dealing with GISs and of local or state officials and functionaries is that of emerging socially useful

dimensions of the GISs. Local Government is the central field where the relation between GIS applications and social or population strata can be tested. For the social acceptance and, much more, the active participation in the geographic knowledge management, there is much to be done. We will conclusively underline: a) the need of rational and transparent diffusion of the funds directed to GIS applications, especially in countries such as Greece, with a background of 'negative' administrative practices, b) the critical role that a national consolidation framework can play, in supporting integrated GIS applications development, especially for small cities and their Local Government Organizations, while ensuring their energetic participation on the planning level. Finally and as far as it concerns Greek reality, c) the energetic support of the recently established 'National Infrastructure' (NGII Research team, 2003) for geographic information with initiatives such as spatial data acquisition and national base map creation, standardization, update and metadata documentation. The aforementioned projects must be followed by certain 'diffusion' policies, specialized on the level of necessary geo-databases provision to Local Government Organizations.

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